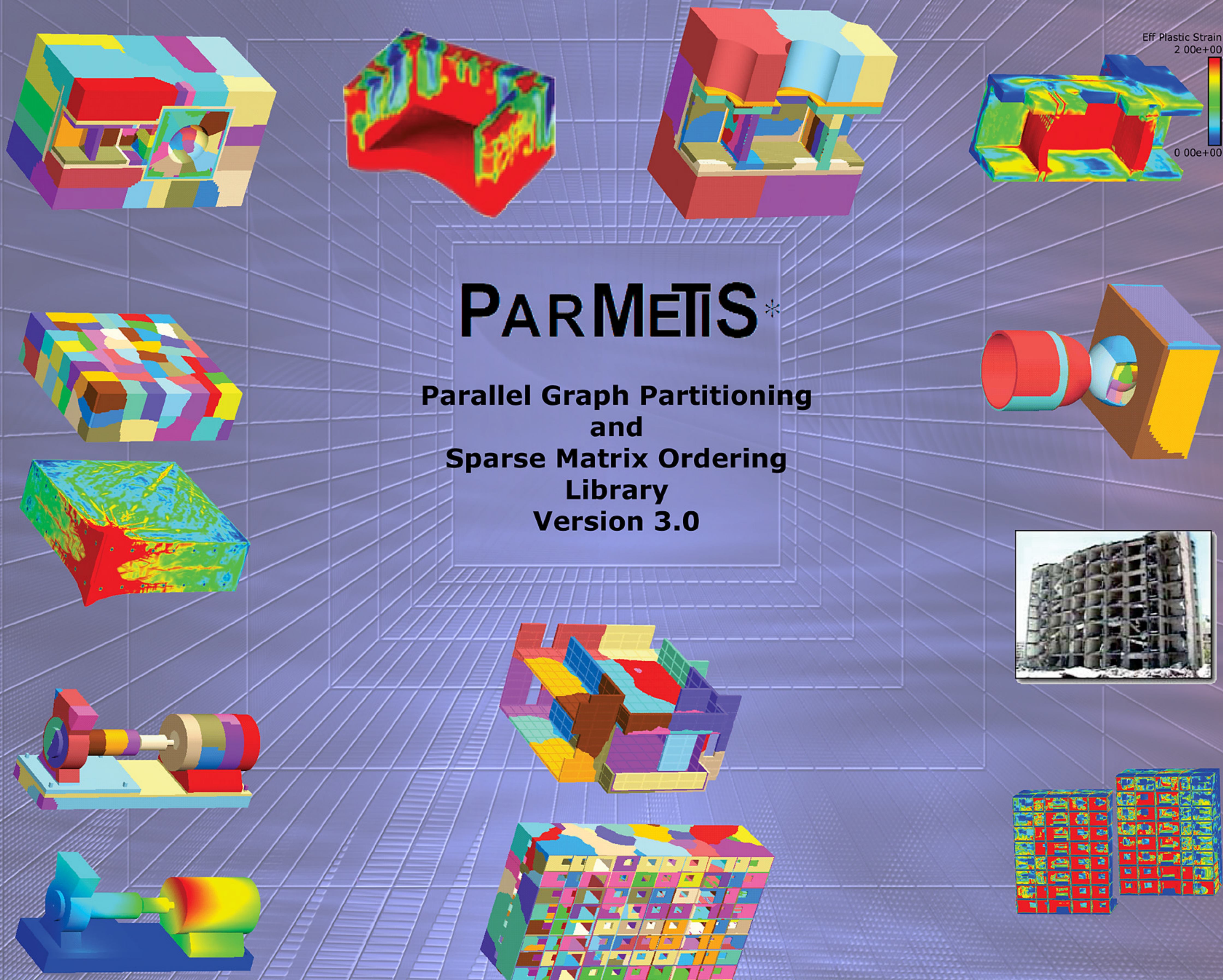


# Scalable Parallel Algorithms for Partitioning Multi-Physics Computations

High-performance scientific simulations have become an essential tool for the Army scientist in support of Army research programs. In order for the high performance mesh-based scientific simulations to be effectively executed on a wide variety of parallel architectures, the underlying finite element meshes must be distributed among the processors such that the computations are balanced and the inter-processor communication is minimized. Research at AHPCRC is focusing on developing novel multi-constraint and multi-objective partitioning problem formulations and algorithms that can correctly model and solve problems arising in emerging high-performance numerical simulations. The goal of these algorithms is to accurately model topological and geometric constraints and objectives that are defined dynamically during the partitioning phase itself. This research allows emerging high performance numerical simulations to be efficiently executed on parallel computing platforms.



# PARMETIS\*

# Parallel Graph Partitioning and Sparse Matrix Ordering Library Version 3.0



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